AMENDMENTS TO THE CLAIMS

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double-bracketed text indicating deletions.

LISTING OF CLAIMS

1. A producing process of a sterile plant, comprising causing a plant to produce a chimeric protein, in which a transcription factor that promotes expression of a gene associated with formation of floral organs is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so that the chimeric protein suppresses transcription of the gene associated with formation of floral organs and thereby sterilize the plant.

2. A producing process of a sterile plant, comprising causing a plant to produce a chimeric protein, in which a transcription factor that promotes expression of a gene associated with formation of floral organs is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so that the chimeric protein suppresses transcription of the gene associated with formation of floral organs and thereby changes flower morphology.

3. A producing process of a sterile plant as set forth in claim 1, wherein the transcription factor that promotes expression of a gene associated with formation of floral organs is a transcription factor associated with formation of stamen or pistil.

4. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1 through 3~~, wherein at least formation of stamen is suppressed in the sterile plant.

5. A producing process of a sterile plant as set forth in claim 3, wherein the transcription factor associated with formation of stamen or pistil is a transcription factor that promotes transcription of a gene associated with dehiscence of anther, and wherein a chimeric protein in which the transcription factor is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor is produced in a plant so as to suppress dehiscence of anther.

6. A producing process of a sterile plant as set forth in claim 5, wherein the transcription factor that promotes transcription of a gene associated with dehiscence of anther is a transcription factor with an MYB domain, and wherein a chimeric protein in which the transcription factor is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor is produced in a plant so as to suppress transcription of the gene associated with dehiscence of anther.

7. A producing process of a sterile plant as set forth in claim 5 ~~or 6~~, wherein the plant has sterile female organs.

8. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~5 through 7~~, wherein the plant produces sterile pollens.

9. A producing process of a sterile plant as set forth in claim 1, wherein ~~comprising causing a plant to produce a chimeric protein, in which a~~ the transcription factor associated with formation of stamen and pistil is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so as to produce a double-flowered plant.

10. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1 through 4~~, comprising a transforming step of introducing into plant cells a recombinant expression vector that includes a chimeric gene containing (i) a coding gene of the transcription factor and (ii) a polynucleotide that encodes the functional peptide.

11. A producing process of a sterile plant as set forth in claim 10, further comprising an expression vector constructing step of constructing the recombinant expression vector.

12. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1, 3, and 5 through 8~~, comprising a transforming step of introducing into plant cells a recombinant expression vector that includes a chimeric gene containing (i) a coding gene of the transcription factor and (ii) a a polynucleotide that encodes the functional peptide.

13. A producing process of a sterile plant as set forth in claim 12, further comprising an expression vector constructing step of constructing the recombinant expression vector.

14. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1, 3, and 5 through 9~~, comprising a transforming step of introducing into plant cells a recombinant expression vector that includes a chimeric gene containing (i) a coding gene of the transcription factor and (ii) a a polynucleotide that encodes the functional peptide.

15. A producing process of a sterile plant as set forth in claim 14, further comprising an expression vector constructing step of constructing the recombinant

expression vector.

16. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1 through 4, 10, and 11~~, wherein the transcription factor is:

(e) a protein with an amino acid sequence represented by SEQ ID NO: 134, or

(f) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 134, and capable of promoting expression of the gene associated with formation of floral organs.

17. A producing process of a sterile plant as set forth in ~~any one of~~ claim 10 ~~or 11~~, wherein the coding gene of the transcription factor is:

(e) a gene that has a base sequence of SEQ ID NO: 135 as an open reading frame; or

(f) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 135, and that encodes the transcription factor that promotes expression of the gene associated with formation of floral organs.

18. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1, 3, 5, 7, 8, 12, and 13~~, wherein the transcription factor is:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 136, or

(b) a protein with the substitution, deletion, insertion, and/or addition in the

amino acid sequence represented by SEQ ID NO: 136, and capable of promoting transcription of a gene associated with dehiscence of anther.

19. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1, 3, 5, 7, 8, 12, and 13~~, wherein the transcription factor exhibits at least ~~shares~~ 50% ~~or greater~~ homology with the amino acid sequence of SEQ ID NO: 136, and is a protein capable of promoting transcription of a gene associated with dehiscence of anther.

20. A producing process of a sterile plant as set forth in claim 12 ~~or 13~~, wherein the coding gene of the transcription factor is:

(c) a gene that has a base sequence of SEQ ID NO: 137 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene

of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 137, and that encodes the transcription factor that promotes transcription of a gene associated with dehiscence of anther.

21. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1, 3, 6 through 8, 12, and 13~~, wherein the transcription factor is:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 138; or

(b) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 138, and capable of promoting transcription of a gene associated with dehiscence of anther.

22. A producing process of a sterile plant as set forth in claim 12 ~~or 13~~, wherein the coding gene of the protein is:

(c) a gene that has a base sequence of SEQ ID NO: 139 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 139, and that encodes the transcription factor that promotes transcription of a gene associated with dehiscence of anther.

23. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1, 3, 9, 14 and 15~~, wherein the transcription factor is:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 140; or

(b) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 140.

24. A producing process of a sterile plant as set forth in claim 14 ~~or 15~~, wherein the coding gene of the transcription factor is:

(c) a gene that has a base sequence of SEQ ID NO: 141 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 141, and that encodes a protein associated with formation and pistil.

25. A producing process of a sterile plant, said process using a gene that encodes:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 136; or

(b) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 136, and capable of promoting transcription of a gene associated with dehiscence of anther, or

said process using:

(c) a gene that has a base sequence of SEQ ID NO: 137 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 137.

26. A producing process of a sterile plant as set forth in ~~any one of~~ claims ~~1 through 25~~, wherein the functional peptide has an amino acid sequence represented by one of:

(1) X1-Leu-Asp-Leu-X2-Leu-X3, where X1 represents 0 to 10 amino acid residues, X2 represents Asn or Glu, and X3 represents at least 6 amino acid residues;

(2) Y1-Phe-Asp-Leu-Asn-Y2-Y3, where Y1 represents 0 to 10 amino acid residues, Y2 represents Phe or Ile, and Y3 represents at least 6 amino acid residues;

(3) Z1-Asp-Leu-Z2-Leu-Arg-Leu-Z3, where Z1 represents Leu, Asp-Leu, or Leu-Asp-Leu, Z2 represents Glu, Gln, or Asp, and Z3 represents 0 to 10 amino acid residues; and

(4) Asp-Leu-Z4-Leu-Arg-Leu, where Z4 is Glu, Gln, or Asp.

27. A producing process of a sterile plant as set forth in ~~any one of~~ claims 1 ~~through 25~~, wherein the functional peptide has an amino acid sequence corresponding ~~represented~~to an amino acid sequence selected from a group consisting of ~~by any one of~~ SEQ ID NOS: 1 ~~-~~ ~~through~~ 17.

28. A producing process of a sterile plant as set forth in claim 1, wherein the functional peptide is:

(e) a peptide with amino acid sequence represented by SEQ ID NO: 18 or 19; or

(f) a peptide with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 18 or 19.

29. A producing process of a sterile plant as set forth in ~~any one of~~ claims 1 ~~through 25~~, wherein the functional peptide has an amino acid sequence represented by:

α1-Leu-β1-Leu-γ1-Leu ...(5)

wherein α1 is selected from a group consisting of Asp, Asn, Glu, Gln, Thr and~~, or~~ Ser~~;~~,

β1 is selected from a group consisting of Asp, Gln, Asn, Arg, Glu, Thr, Ser and~~, or~~ His~~;~~, and

γ1 is selected from a group consisting of Arg, Gln, Asn, Thr, Ser, His, Lys and~~, or~~ Asp.

30. A producing process of a sterile plant as set forth in ~~any one of~~ claims 1 ~~through 25~~, wherein the functional peptide has an amino acid sequence represented by:

α1-Leu-β1-Leu-γ2-Leu ...(6)

α1-Leu-β2-Leu-Arg-Leu ...(7)

α2-Leu-β1-Leu-Arg-Leu ...(8)

wherein α1 is selected from a group consisting of Asp, Asn, Glu, Gln, Thr and Ser;

α2 is selected from a group consisting of Asn, Glu, Gln, Thr and Ser;

β1 is selected from a group consisting of Asp, Gln, Asn, Arg, Glu, Thr, Ser and His;

β2 is selected from a group consisting of Asn, Arg, Thr, Ser and His; and

γ2 is selected from a group consisting of Gln, Asn, Thr, Ser, His, Lys and Asp.

31. A producing process of a sterile plant as set forth in claims 1, wherein the functional peptide has an amino acid sequence represented by a sequence selected from a group consisting of SEQ ID NOS: 20, 35, 38, 40 and 152.

32. A producing process of a sterile plant as set forth in claims 1, wherein the functional peptide has an amino acid sequence represented by SEQ ID NO: 36 or 37.

33. A sterile plant, which is produced by the producing process of claims 1.

34. A sterile plant as set forth in claim 33, wherein the sterile plant includes at least one of a group consisting of ~~:~~ an adult plant; a plant cell; a plant tissue; a callus; and a seed.

35. A sterile plant producing kit for performing the producing process of ~~any one of~~ claims ~~1 through 32~~, said kit comprising a recombinant expression vector that includes:

a gene that encodes a transcription factor that promotes expression of a gene associated with the formation of a structure selected from a group consisting of floral organs, ~~formation of~~ stamen, pistil and ~~or pistil,~~ dehiscence of anther~~, or formation of stamen and pistil~~;

a polynucleotide that encodes a functional peptide that converts an arbitrary transcription into a transcription repressor; and

a promoter.

36. A sterile plant producing kit as set forth in claim 35, further comprising:

a composition ~~chemicals~~ for introducing the recombinant expression vector into plant cells.

* * * * *